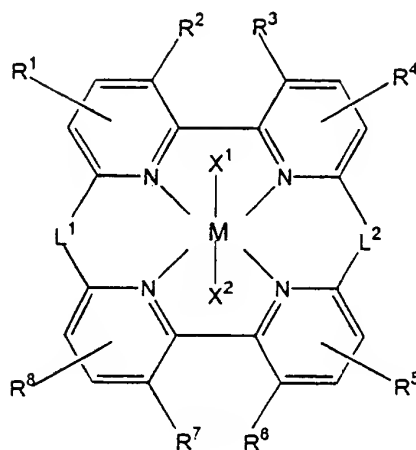


1 1. A metal complex of the following formula:



2 wherein

3 each of R¹, R², R³, R⁴, R⁵, R⁶, R⁷, and R⁸,
4 independently, is hydrogen, alkyl, alkoxy, hydroxyl,
5 hydroxylalkyl, halo, haloalkyl, amino, aminoalkyl,
6 alkylcarbonylamino, alkylaminocarbonyl, alkylcarbonyl,
7 alkylcarbonylalkyl, alkoxycarbonyl, alkylcarbonyloxy,
8 cycloalkyl, heterocycloalkyl, aryl, aralkyl, heteroaryl, or
9 heteroaralkyl; each of R² and R³, and R⁶ and R⁷,
10 independently, optionally joining together to form a cyclic
11 moiety fused with the two pyridyl rings to which R² and R³,
12 or R⁶ and R⁷ are bonded; the cyclic moiety, if present,
13 optionally being substituted with alkyl, alkoxy, hydroxyl,
14 hydroxylalkyl, halo, haloalkyl, amino, aminoalkyl,
15 alkylcarbonylamino, alkylaminocarbonyl, alkylcarbonyl,
16 alkylcarbonylalkyl, alkoxycarbonyl, alkylcarbonyloxy,
17 cycloalkyl, heterocycloalkyl, aryl, aralkyl, heteroaryl, or
18 heteroaralkyl;

19 each of L^1 and L^2 , independently, is $-C(R^a)(R^b)-$, $-O-$,
20 $-S-$, or $-N(R^c)-$; each of R^a , R^b , and R^c , independently, is
21 hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl,
22 heteroaryl, aralkyl, or heteroaralkyl;
23 M is a Co, Ni, Ru, Rh, Mn, Os, Ag, Cr, Zn, Cd, Hg,
24 Re, Ir, Pt, or Pd ion; and
25 each of X^1 and X^2 , independently, is a labile ligand;
26 or a salt thereof.

1 2. The metal complex of claim 1, wherein each of
2 R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , R^7 , and R^8 , independently, is hydrogen,
3 alkyl, or alkoxy.

1 3. The metal complex of claim 1, wherein each of R^2
2 and R^3 , and R^6 and R^7 , independently, join together to form a
3 cyclic moiety; the cyclic moiety being benzene.

1 4. The metal complex of claim 3, wherein the cyclic
2 moiety is unsubstituted.

1 5. The metal complex of claim 4, wherein each of
2 R^1 , R^4 , R^5 , and R^8 , independently, is hydrogen, alkyl, or
3 alkoxy.

1 6. The metal complex of claim 5, wherein each of
2 R^1 , R^4 , R^5 , and R^8 , independently, is hydrogen.

1 7. The metal complex of claim 6, wherein each of L^1
2 and L^2 , independently, is $-N(R^c)-$ where R^c is hydrogen.

1 8. The metal complex of claim 7, wherein M is Co.

1 9. The metal complex of claim 8, wherein X^1 and X^2 ,
2 independently, is trifluoroacetate.

1 10. The metal complex of claim 9, wherein said
2 complex is cobalt(II) (hexaazacyclophane) (trifluoro-
3 acetate)₂.

1 11. The metal complex of claim 1, wherein each of
2 L^1 and L^2 , independently, is -S- or -N(R^c)-.

1 12. The metal complex of claim 11, wherein each of
2 L^1 and L^2 , independently, is -N(R^c)- where R^c is hydrogen.

1 13. The metal complex of claim 1, wherein M is Co,
2 Ru, or Mn.

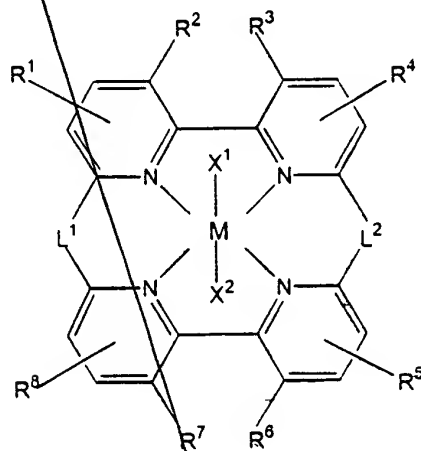
1 14. The metal complex of claim 13, wherein M is Co.

1 15. The metal complex of claim 1, wherein X^1 and X^2 ,
2 independently, is H₂O, Cl, trifluoroacetate, or pyridine.

1 16. The metal complex of claim 15, wherein X^1 and
2 X^2 , independently, is trifluoroacetate.

10039069 010202

1 17. A method of specifically cleaving a nucleic
2 acid bulge, the method comprising contacting the nucleic
3 acid bulge with a metal complex having the following
4 formula:



5 wherein
6 each of R¹, R², R³, R⁴, R⁵, R⁶, R⁷, and R⁸,
7 independently, is hydrogen, alkyl, alkoxy, hydroxyl,
8 hydroxylalkyl, halo, haloalkyl, amino, aminoalkyl,
9 alkylcarbonylamino, alkylaminocarbonyl, alkylcarbonyl,
10 alkylcarbonylalkyl, alkoxycarbonyl, alkylcarbonyloxy,
11 cycloalkyl, heterocycloalkyl, aryl, aralkyl, heteroaryl, or
12 heteroaralkyl; each of R² and R³, and R⁴ and R⁵,
13 independently, optionally joining together to form cyclic
14 moiety fused with the two pyridyl rings to which R² and R³,
15 or R⁴ and R⁵ are bonded; the cyclic moiety, if present,
16 optionally being substituted with alkyl, alkoxy, hydroxyl,
17 hydroxylalkyl, halo, haloalkyl, amino, aminoalkyl,
18 alkylcarbonylamino, alkylaminocarbonyl, alkylcarbonyl,
19 alkylcarbonylalkyl, alkoxycarbonyl, alkylcarbonyloxy,
20 cycloalkyl, heterocycloalkyl, aryl, aralkyl, heteroaryl, or
21 heteroaralkyl;

22 each of L^1 and L^2 , independently, is $-C(R^a)(R^b)-$, $-O-$,
23 $-S-$, or $-N(R^f)-$; each of R^a , R^b , and R^c , independently, is
24 hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl,
25 heteroaryl, aralkyl, or heteroaralkyl;
26 M is a Fe, Co, Ni, Ru, Rh, Mn, Os, Ag, Cr, Zn, Cd,
27 Hg, Re, Ir, Pt, or Pd ion; and
28 each of X^1 and X^2 , independently, is a labile ligand;
29 or a salt thereof.

1 18. The method of claim 17, wherein each of R^2 and
2 R^3 , and R^6 and R^7 , independently, join together to form a
3 cyclic moiety; the cyclic moiety being benzene.

1 19. The method of claim 18, wherein the cyclic
2 moiety is unsubstituted.

1 20. The method of claim 19, wherein each of R^1 , R^4 ,
2 R^5 , and R^8 , independently, is hydrogen.

1 21. The method of claim 20, wherein each of L^1 and
2 L^2 , independently, is $-N(R^c)-$ where R^c is hydrogen.

1 22. The method of claim 21, wherein M is Co.

1 23. The method of claim 22, wherein X^1 and X^2 ,
2 independently, is trifluoroacetate.

1 24. The method of claim 23, wherein said complex is
2 cobalt(II)-(hexaazacyclophane)(trifluoroacetate)₂.

1 25. The method of claim 17, wherein the method is
2 performed in the presence of hydrogen peroxide.

1 26. The method of claim 17, wherein the nucleic
2 acid bulge contains 1-5 unpaired nucleotides.

1 27. The method of claim 26, wherein the nucleic
2 acid bulge contains 1-3 unpaired nucleotides.

202010 6906E007